PS 2-343

### *IN VIVO* EFFICACY EVALUATION FOR AN ALCOHOL-BASED HAND RUB (ABHR) AGAINST HUMAN NOROVIRUS SURROGATES

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**Purpose**: Hand hygiene is a crucial measure for infection control to prevent transmission of pathogens causing acute infectious gastroenteritis through contaminated hands. We mainly report here a battery of virucidal efficacy data through determining human norovirus surrogate-eliminating activity *in vivo* for a newly-improved Alcohol-Based Hand Rub (ABHR) and also focus on testing-methodological aspects from the standpoint of standardization in Japan.
**Methods**: A newly-improved ABHR was evaluated according to ASTM E 2011-13 *in vivo*. Virucidal assays were also conducted against varieties of strains including non-enveloped viruses according to the testing methodology of ASTM E 1052-11 *in vitro*.
**Results**: The ABHR demonstrated significant efficacies of greater than $2.30 \pm 0.28$ $\log_{10}$ reduction against Feline calicivirus and of $2.48 \pm 0.47$ $\log_{10}$ reduction against Murine norovirus as surrogates for human norovirus relative to baseline viral populations based on the *in vivo* testing method ($p < 0.05$) and met the criteria of Health Canada's guidance in 2009. A series of efficacy data against 10 kinds of viruses including Feline calicivirus (more than 4.97 $\log_{10}$ reduction) and Murine norovirus (2.75 $\log_{10}$ reduction) in 15 second were also given *in vitro*.
**Conclusions**: From the study results, it was found the novel ABHR had a potential to pass the efficacy criteria of the guidance of Health Canada. Furthermore, we presented a possibility to choose a testing method based on outline of European committee for standardization (CEN) protocol as a standardized methodology in Japan for *in vivo* virucidal efficacy evaluation in the future.

PS 2-344

### DIFFICULT-TO-TREAT LIFE-THREATENING CMV PNEUMONIA: A CASE REPORT

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**Purpose**: Cytomegalovirus (CMV) infection occurs in 0 to 36% of critically ill patients, mostly between 4 and 12 days after intensive care units (ICU) admission. Treatment of CMV pneumonia may be difficult. We report a case of treatment failure of CMV pneumonia.
**Case report**: A 66-year-old man of nephrotic syndrome, chronic kidney disease (CKD), diabetes mellitus, adrenal insufficiency with regular control at our OPD suffered from dysuria with decreased urine output for 3 days. He was brought to emergency department on September 8, 2014. Laboratory data shows leukocytosis, creatinine 7.51 mg/dL, and hyperkalemia. Emergent hemodialysis and ceftriaxone were used. He was transferred to the ward. Regular hemodialysis was used from perm-cath since September 17, 2014. Due to conscious change, brain CT was performed and showed small deep old infarct. He was admitted to intensive care unit (ICU) on October 12, 2014. He received emergent endotracheal tube insertion with mechanical ventilator use due to sudden onset of dyspnea and respiratory failure. CXR showed worsening of mixed airspace and interstitial infiltration over bilateral lungs. Sputum culture showed Pseudomonas aeruginosa. Antibiotic was shifted to meropenem and tigecycline. Blood and sputum CMV-PCR showed positive, CMV viral load was low-positive (<137 IU/mL). Aspergillus Ag index showed 0.15 (negative). Ganciclovir was given on October 15, 2014. Unstable BP was noted during hemodialysis. CXR showed mixed alveolar and interstitial infiltration over both lungs, like pneumonia and adult respiratory distress syndrome. Profound shock then developed requiring high dose vasopressors on October 18, 2014. His condition remained worsening despite aggressive treatment. Family members requested palliative therapy and the patient expired on October 24, 2014.
**Conclusion**: Although the patient did not have cancer, organ transplantation and AIDS, CKD with poorly responsive pneumonia may suspect CMV pneumonia. Anti-CMV immunoglobulin may be added to ganciclovir therapy for life-threatening CMV pneumonia, particularly with pathologic diagnosis.

PS 2-345

### INTRANASAL VACCINATION WITH POLY(I:C) AND CPG AS ADJUVANTS ENHANCES MUCOSAL AND SYSTEMIC IMMUNE RESPONSES TO AN ENTEROVIRUS 71 VACCINE

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**Purpose**: Mucosal vaccines can efficiently induce secretory IgA at mucosal surfaces, thereby preventing or limiting infection at the site of virus entry. Since Toll-like receptor (TLR) ligands can act as both the systematic and mucosal adjuvants. Poly(I:C) is structurally similar to double-stranded RNA, which is present in some viruses and is a stimulant of TLR3. CpG oligodeoxynucleotides (ODNs), resembling bacterial DNA, CpG could induce the innate immune response through activation of TLR9. We used poly(I:C) and CpG as adjuvants to study the Enterovirus 71 (EV71) mucosal vaccine.
**Methods**: Each mouse was intranasal immunized at 0, 3, and 6 weeks. To evaluate the humoral immune responses, the anti-EV71 IgG and IgA were assay, and the neutralization test were detected. To evaluate the cellular immune responses, spleens were harvested to test the splenocyte proliferation and cytokines production.
**Results**: Our datas showed that EV71-specific IgA and IgG titers of serum, nasal wash, BALF, and feces in EV71+poly(I:C)+CpG group was significantly higher than EV71+poly(I:C) group or EV71+CpG group. Furthermore, there were more EV71-specific IgA and IgG-producing cells in EV71 adjuvanted with ploy(I:C)+CpG group. In addition, T-cell proliferative responses, IFN-ã, IL-10, and IL-17 secretion were significantly increased when the EV71 was formulated with poly(I:C)+CpG. More importantly, these antibodies were able to neutralize the infectivity of EV71 (C2 genotype). They also could cross-neutralized B4 and B5 genotype of EV71 infection.

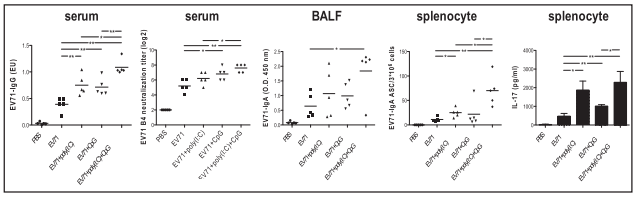


Figure. Intranasal immunized EV71 with poly(I:C) and CpG to mice can develop both specific humoral and cellular immune responses to EV71.

**Conclusions**: Our results indicated that poly(I:C) combined with CpG is an effective intranasal adjuvant for EV71 vaccine, and IL-17 played an important role in mucosal immunity.

PS 2-346

### COMPLIANCE AMONG CRITICAL CARE NURSES WITH PERFORMING ORAL CARE PROTOCOLS FOR MECHANICALLY VENTILATED PATIENTS

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**Purpose**: This study examined the factors related to compliance among critical care nurses with performing oral care for mechanically ventilated patients in intensive care units.
**Methods**: This study was carried out at a regional teaching hospital comprising a 63-bed adult intensive care unit (ICU) and a 20-bed subacute respiratory care center (RCC). The protocol for oral care for mechanically ventilated patients includes oral decontamination with 0.12% chlorhexidine every eight hours (at the end of the day shift, the evening shift, and the night shift).

**Results**: A total of 133 critical care nurses were observed for oral care compliance, and a total of 759 oral care opportunities were observed, including 278 opportunities at the end of the day shift, 267 at the end of the evening shift, and 214 at the end of the night shift. The overall compliance rate was 83.3%. Compliance with performing oral care was significantly higher among nurses aged $>$ 30 years, male nurses, nurses with higher academic degrees, team leaders, senior RNs, and ICU licensed nurses than among nurses $\leqq$ 30 years, female nurses, nurses with lower academic degrees, non-team leaders, junior RNs, and non-ICU licensed nurses (all $P < 0.05$). In contrast, years of experience in critical care settings and VAP-associated education were not associated with oral care compliance. Results of the multivariate analysis disclosed that age, academic degree, ICU license, and location were independently associated with oral care compliance.
**Conclusions**: Oral care compliance varied among nurses. Larger scale surveillance studies are needed to identify the factors associated with compliance among nurses with performing oral care for patients on mechanical ventilation.

## PS 2-347

### EVALUATION OF A CHLORINE DIOXIDE WATER TREATMENT SYSTEM TO CONTROL LEGIONELLA SPECIES IN A HOSPITAL WATER SYSTEM

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**Purpose**: The contamination of the water supply system by *Legionella*, so often results in health care associated pneumonia events. In order to exclude the pathogens in the water supply system, often used in medical institutions of copper and silver ions exchange, chlorine dioxide, ozone or single filters and other disinfection methods. With expert recommendations, reference literature, and take into some issues such as hospital facilities and the building position, we use chlorine dioxide disinfection methods for water disinfection in hospitals.
**Methods**: We monitored the *Legionella* colonies in the chilled water system. A medical center in central Taiwan since January 2013, in hospital water systems began to routinely monitor growing concentration of Legionella. In April of 2013 began the installation of chlorine dioxide produced machines system, maintaining the concentration of chlorine dioxide in hospital water systems.Water samples were collected for *Legionella* enumeration by a standardized culture method. Routine environmental cultures were performed to evaluate the efficacy.
**Results**: From January 2013 the detection rate was 20%, by 2014 to July, had 16 consecutive months with no detectable *Legionella*.
**Conclusions**: According to our monitoring results indicate that chlorine dioxide disinfection method used in chilled water system of hospital had the effectiveness of control *Legionella*.By treatment using ClO2, we could control *Legionella* colonization rate in the test building.

## PS 2-348

### ROLE OF LABORATORY IN DETECTION, EFFECTIVE MANAGEMENT AND CONTROL OF OUTBREAKS OF HOSPITAL ASSOCIATED INFECTIONS

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**Purpose**: Laparoscopic cholecystectomy reduces morbidity, mortality and duration of stay. Laparascope is delicate with multiple channels, hence cleaning and sterilization is tedious. If not done properly it can be a source of cross infection among patients.
**Methods**: All gall bladders removed by laparoscopic cholecystectomy are sent to microbiological laboratory. They are cultured according to routine laboratory methods and isolated organisms are identified by VITEK 2, API20E and API20NE. Antibiotic sensitivity is performed according to Clinical Laboratory Standard Institute (CLSI) guidelines
**Results**: During the period from March 2012 occasional isolations of *Serratia marcescens* went unnoticed. In September 2012, within a span of 20 days, *Serratia marcescens* were isolated from eight gall bladders following laparoscopic cholecystectomy. One of these 8 patients was re-admitted with surgical site infection with *Serratia marcescens* and another patient who didn't grow *Serratia marcescens* from the removed gall bladder was admitted with *Serratia marcescens* septicemia Similar antibiogram of all these isolates lead to a suspicion of an outbreak.
This was investigated and infection control practices including cleaning, disinfection and sterilization of endoscopes were revisited and performed. Environmental samples and specimens sent from the endoscopes and solutions were negative for *Serratia marcescens* prior and after the intervention. Following these interventions no single *Serratia marcesens* was isolated from laparoscopic cholecystectomy patients to date.
**Conclusion**: Meticulous vigilant monitoring of isolates from specimens can help to identify an outbreak and will help the infection control unit to control it. Hence the role of laboratory in identifying them early is essential. Though environmental samples and specimens sent from the endoscopes and solutions were negative, the absence of *Serratia marcesens*, to date, from any specimens following laparoscopic cholecystectomy, emphasis the need of proper cleaning disinfection and sterilization. Continuous education on infection control policies and monitoring of the aseptic preparation are necessary for personnel involved.

## PS 2-349

### IS TIGECYCLINE PRESCRIBED TO TREAT CARBAPENEM-RESISTANT *ACINETOBACTER BAUMANNII* COMPLICATED URINARY TRACT INFECTIONS

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**Purpose**: In general, carbapenem-resistant *Acinetobacter baumannii* (CRAB) is resistant most of antibiotics, except tigecycline and colistin. Colistin has nephrotoxicity, so it is inappropriate antibiotic in some conditions, such as in patients with renal impairment. Tigeceyline has low urinary concentration, so it is not usually recommended to treat complicated urinary tract infections (cUTI). Hence, in case of CRAB cUTI, the treatment options are severe limited. In this study, we reported two cases of CRAB cUTI successfully treated with two different dose of tigecycline.
**Methods**: We reported two cases of CRAB cUTI treated with tigecycline, 50 mg and 100 mg, respectively, every 12 hours for 14 days. Standard disk diffusion method was used for antimicrobial susceptibility testing. The interpretation of tigecycline against *A. baumannii* isolates was according to the U.S. Food and Drug Administration interpretive criteria for Enterobacteriaceae (susceptible, minimal inhibitory concentration$\leqq$2 μg/ml).
**Results**: The two *A. baumannii* isolates were only susceptible to tigecycline (colistin was not tested). The two cases of CRAB cUTI treated with tigecycline were clinical treatment success; however, both repeated urine cultures were still positive with CRAB.
**Conclusions**: As the above mentioned, the treatment options for CRAB cUTI are limited. In our option, tigecycline may be prescribed to treat CRAB cUTI, especially in case of no other appropriate antibiotics available. The reason of clinical treatment success may be tigecycline having good renal concentration. In contrast, the reason of being unable to eradicate CRAB may be it having low urinary concentration.

## PS 2-350

### THE HEALTH-CARE ASSOCIATED INFECTION IN VENTILATOR-DEPENDENT PATIENTS: THE IMPACT OF WEANING

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**Purpose**: According to the National Health Insurance Administration, there were 11,573 people dependent ventilator. The Huge medical costs, and 70—80% of patients are unconscious, and the cost of waste caused an invalid medical controversy. Therefore, improving the prognosis of ventilator-